

PATENT  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: T. HIRAMOTO *et al.* ) Confirmation No. 5709  
Application No. 10/558,388 )  
Filed: November 29, 2005 ) Art Unit: 1794  
For: FRESH LEAF POWDER AND ) Examiner: Hong MEHTA  
PROCESSED PRODUCT, EXTRACT, )  
OIL AND AROMA OBTAINABLE FROM )  
FRESH TEA LEAF POWDER )

DECLARATION OF TADAHIRO HIRAMOTO UNDER 37 C.F.R. § 1.132

Sir:

I, Mr. Tadahiro Hiramoto, declare as follows:

1. I received my Ph.D. degree from the Okayama University in March of 1993 for studies on the molecular mechanism of the interaction between barley and barley powder mildew.
2. I have been employed by the Takasago International Corporation since April of 1993, the assignee of the present application, where I had worked in the Central Research Laboratory of the Aroma Science & Technology Laboratory, conducting research regarding the development of functional food materials and the application of them to food products. Since July 2006, I have been a Director of 5th division in the Flavor Research in the Corporate Research & Development

Division, conducting research regarding the development of functional food materials and the application of them to food products.

3. I am a co-inventor of the subject matter described and claimed in the above-referenced patent application, U.S. Patent Application Number 10/558,388 (hereinafter "the '388 patent application").

4. I have reviewed and understand that new claims 32-47 are currently pending in the '388 patent application.

5. I have read and understand the Office Action that was mailed by the U.S. Patent and Trademark Office on December 19, 2008 regarding the '388 patent application, particularly pages 2-5 (*i.e.*, the claim rejections under 35 U.S.C. §§ 102(b) and 103).

6. This declaration is submitted to demonstrate the differences of claimed compositions comprising including, *inter alia*, physically damaging the fresh tea leaf, keeping the fresh tea leaf under shade conditions after collecting, allowing the fresh tea leaf to stand for 30 minutes to 72 hours, freeze-drying and subsequently milling the same over the compositions disclosed in the cited references.

7. The compositions claimed in the pending application enhance and strengthen the aroma and improve the flavor of tea leaf, a vegetable, a fruit, a flower or the like by adding one or several exogenous enzymes.

8. It is known in the art that the aroma and/or flavor components in the tea leaf, a vegetable, a fruit, a flower or the like are produced by the action of various enzymes. Therefore, attempts have been made to strengthen the aroma and improve the flavor of tea leaf, a vegetable, a fruit, a flower or the like by adding one or several exogenous enzymes, which are mainly produced by microorganism.

9. For example, it is disclosed in the "Background Art" portion of the specification that protease and tannase can be used to increase components relating to the taste and the body. (See, e.g., the 2nd paragraph on page 3 of the specification discussing Document 3). It is also disclosed that R-glucosidase can be used to treat tea or tea extracts to thereby elevate the aroma intensity. (See, e.g., the 3rd paragraph on page 3 of the specification discussing Document 4). Moreover, cellulose can be used to treat a vegetable juice to improve the flavor. (See, e.g., the 2nd paragraph on page 4 of the specification discussing Document 5).

10. However, previous attempts do not produce desired results since the following three deficiencies still existed in current used methods:

- (1) It is well-known in the art that the catalysis activity of enzyme is highly substrate-specified. Adding one or several kinds of enzymes cannot effectively and fully enhance the aroma of the tea leaf, a vegetable, a fruit, a flower or the like;
- (2) Tea leaf, vegetable, fruit, and flower are all plants, whereas the enzymes used in the prior art are mainly produced by microorganisms. The compatibility of enzymes produced by microorganism and plant may be poor, which may make it difficult to effectively obtain the fully and balanced improvement of the aroma or flavor; and
- (3) Even if the enzymes used in the prior art have good compatibility when used for treating plant and increase some special kinds of aroma components, such an

increase only occur in one or several kinds of aroma components rather than a fully and balanced improvement of all aroma components and will affect the balance of the flavor.

11. The inventors of the claims have found the fresh tea leaf powder includes a plurality of enzymes (enzyme group for producing aroma), which are balanced and are effective to make a tea leaf, a vegetable, a fruit, a flower or the like produce aroma. The claims inventively and first provides the solution of using fresh tea leaf powder to treat a tea leaf, a vegetable, a fruit, a flower or the like and resolves the problem existed in the art: enhancing the aroma of the tea leaf, a vegetable, a fruit, a flower or the like in a fully and balanced manner with low cost, and thereby improve the flavor of the treated products. For example, the effect of oolong tea treated with fresh tea leaf powder is compared with those treated with  $\beta$ -Glc. (See, e.g., line 16 on page 37 to line 23 on page 47 of the specification). The results of the Sensory Evaluation test show the aroma intensity and taste of the Oolong tea treated with fresh tea leaf powder are much better than that treated with  $\beta$ -Glc. Moreover, the results of Analysis of Aroma test - further prove that by treating a low-grade tea extract with a fresh tea leaf powder, the aroma compounds can be increased to a level comparable to that of the high-grade tea or higher in a well-balanced manner, whereas treating with  $\beta$ -Glc can not achieve such good effects.

12. Therefore, treating cheap low-grade tea (e.g., 3rd or 4th harvested tea) with the claimed compositions can produce an abstract having a similar strong and balanced flavor to that of the high-grade tea. In other words, the claimed invention provides a high quality product by using cheap raw material with low cost.

13. In addition, the effects of corn (Table 10), apple juice (Table 11), grape juice (Table 12), and orange juice (Table 13) treated with fresh tea leaf powder are compared with those treated

with  $\beta$ -Glc. The results of the Sensory Evaluation test show although some of the smells are strengthened after treating with  $\beta$ -Glc, the aroma in total is off-balanced. Moreover, the products treated with fresh tea leaf powder not only have a highly emphasized smell but also have a balanced and enriched taste.

14. In addition, the tea extract encompassed by the claims can be significantly distinguished from the conventional tea extract as the numerical differences are described in Table A of the specification (please see "Sum of key components"). The compounds F and G in the present invention are superior to the conventional compounds

15. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

By: Tadahiro Hiramoto  
Tadahiro Hiramoto

Dated: Jan., 16<sup>th</sup> 2009